FACT SHEET
The Ohio State University College of Engineering
Fundamentals of Engineering for Honors (FEH) Robot Competition
April 8, 2017, Recreation & Physical Activity Center (RPAC)

THE COMPETITION

• The main objective for each team is to build a self-controlled, self-contained and self-propelled robotic vehicle that will travel over a well-defined course and complete the following tasks:
  o begin the run by responding to a starting light in the floor of the starting area
  o initialize the island’s communication systems by adjusting an antenna
  o extract a core sample from the volcanic rock
  o deliver the core sample to a specified collection bin for processing
  o activate the system for collecting a lava sample by flipping a switch
  o turn on a seismograph recorder by pressing and holding a button for five seconds
  o return to the protective bunker

• Teams will be scored based on their design and how well the robot performs in both individual and head-to-head competition runs.

• Great prizes are awarded to the head-to-head competition winners, as well as for the best engineered, most innovative, most consistent and hottest robots.

• Each team will have one minute to set up its robot before each run. Each run will last two minutes from the time the start light/signal is activated.

THE ROBOTS

• Size: Each robot, in its starting configuration, must be no larger than 9 inches by 9 inches and no taller than 12 inches.

• Parts: Robots are constructed of various materials including aluminum sheet, PVC, acrylic sheet, plywood and Erector set components. A sensor kit was provided, which included a CdS cell, an optosensor and two microswitches or touch sensors. The robots operate with small DC motors and batteries. Students write their own autonomous robot control software which is loaded onto the small microcontroller used by each robot.

• Navigation: Robots navigate by measuring how far they travel, by following lines on the ground, by bumping into the wall and making themselves perpendicular to it, and via the high-definition, camera-based robot positioning system (RPS).

• Judges: The judges for the event will be representatives of the companies that have sponsored the competition through donations. These companies include American Woodmark, ArcelorMittal, Delphi, Garmin, Harris, GE Aviation, Georgia-Pacific, Honda R&D Americas Inc., Nokia, Procter & Gamble and Shell.
THE COURSE

- Size: The course area is approximately 12 feet by 12 feet in size.

- The robot scenario—its conceptualization, design, construction, decoration, all of the electronics and the robot positioning system—were created by the First-Year Engineering Honors Program’s undergraduate and graduate teaching assistants, who are also current Buckeye engineering students.

- Robot positioning system (RPS): Similar in concept to GPS, but uses high-definition USB cameras instead of satellite technology. The HD cameras can identify each robot because each one is outfitted with a unique Quick Response (QR) code. Each robot can receive information from the RPS 10 times per second, enabling it to determine its location and in which direction it is traveling.

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